

Intro to Charge

The CDF and D0 collaborations are preparing to start upgrade projects that will make it possible for the experiments to continue operating at higher and higher luminosities through 2008. The systems needing the most attention for higher-luminosity running are the silicon detectors and the data-acquisition/trigger system. The collaborations have submitted Technical Design Reports (TDRs) for these and other required upgrades. The current schedule calls for installation of the new silicon and other detector components in 2005 or early 2006. For the success of the Tevatron Run II program, it is imperative that both the D0 and CDF upgrades be accomplished on this time scale.

This Director's Baseline Review Committee (BRC) has the primary goal of helping the the upgrade projects in their preparation to successfully complete a DOE Baseline Review. In this regard, the BRC should:

Examine the scope of the proposed upgrades

Determine whether 1) the scope is appropriate for optimizing the research reach of the collider detectors, within the guidelines set forth by the Fermilab Directorate, in this time period and 2) the scope is well defined and understood by key participants. Assess the plans for carrying out the design, prototyping, fabrication, assembly and testing of the proposed upgrades.

Assess the Total Project Cost estimate for the upgrades

Review and assess the detailed “basis of estimate” for the upgrades (both for the R&D components and the “on-project” components). Understand the risks involved in carrying out the projects and assess the cost contingencies that are being proposed.

Assess the realism of the schedule

Is there a detailed schedule, including a critical path, for completing the project? Are milestones appropriate in number and type identified so that both the project teams, Fermilab management, and DOE can effectively track and manage progress? Based on past experience, can the proposed schedules be met? Are appropriate schedule contingencies provided? Is there a “resource loaded schedule” and plan for providing the needed resources (M&S and technical support staff and physicists)? Have techniques such as forward funding by collaborators and phased funding of large contracts been appropriately incorporated into the planning? Does the anticipated funding profile support the resource requirements?

Comment on the proposed management arrangements

Comment on the proposed management arrangements for the upgrades. Assess the probable effectiveness of the proposed management arrangements; the internal project structure, coordination between experiments, coupling to the Particle Physics Division and the Directorate and coordination with the Beams Division. Review and assess the formal required DOE documentation: Acquisition Plan, Project Management Plan, Project Execution Plan (as it sets requirements on the PMP), in addition to Scope, Cost, and Schedule Performance Baseline (which should be “conservatively” derived from the information presented in response to the bullets above) and plans for the use of (and progress toward meeting) cost and schedule reporting tools.

Run IIb Conditions

- The maximum luminosity that the collider will be able to deliver is $\sim 4 \times 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$.
- There are two possible running conditions for Run IIb.
 - 396 ns bunch spacing.
 - Luminosity would be leveled at $2 \times 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$ to optimize detector performance.
 - Integrated luminosity would be the same as if no leveling and initial luminosity of $\sim 3.4 \times 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$.
 - The detectors should operate efficiently, with significant safety margin, at a luminosity of $2 \times 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$.
 - 132 ns bunch spacing.
 - This is a secondary option, since the luminosity would be $\sim 0.5 \times$ that available at 396 ns for the same number of antiprotons.
 - We preserve this option until the effective operation of luminosity leveling is established.